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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,673	12/01/2005	Morten Syslak	2005-1455A	8459

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EXAMINER	
SHEVIN, MARK L	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,673	SYSLAK ET AL.	
	Examiner	Art Unit	
	Mark L. Shevin	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *7-11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 12-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *09/19/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status

1. Claims 1-20, filed as a preliminary amendment on September 19th, 2005, are pending.

Restriction Requirement:

2. In Applicants' response dated March 19th, 2008, invention I, claims 1-6 and 12-20 was elected. Claims 7-11 are thus withdrawn as non-elected and claims 1-6 and 12-20 examined on their merits.

Priority

3. Applicant's claim to benefit of Norwegian patent application 20031276 filed March 19th, 2003, is acknowledged and recorded.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted September 19th, 2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement and has been considered by the examiner. Please refer to applicants' copy of the 1449 submitted herewith.

Claim Objections

5. **Claim 1** is objected to because of the following informalities: The use of parenthetical limitations e.g. "(cold) rolling …" makes it uncertain whether the feature in parentheses is limitation or not. The Examiner interprets (cold) rolling to mean simply "cold rolling" in view of this reference in dependent claim 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1-2 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **US '497** (US 6,238,497 B1) in view of **Fukuda** (US 6,261,706).

US ‘497

US ‘497 is drawn to a method of producing an aluminum alloy fin stock material for use in heat exchangers (Abstract and Col. 2, lines 25-30).

US ‘497 teaches that iron in the aluminum alloy forms intermetallic particles during casting that are relatively small and contribute to particle strengthening but when these particles are instead present as large particles, it is difficult to roll such a material to very thin fin stock gauges (col. 3, lines 19-30).

An aluminum alloy is first continuous strip cast at a predetermined cooling rate to form a strip with a thickness of from 3 to 30 mm (col. 4, lines 16-25).

The cast strip is then rolled to an intermediate gauge by cold rolling and then annealed (col. 3, lines 30-32). The intermediate gauge strip is then cold rolled to final gauge (col. 3, lines 32-34).

US '497 specifically links the average cooling rate with the size of intermetallic particles produced (col. 4, lines 50-65), but do not teach what constitutes large particles.

Fukuda

Fukuda teaches an aluminum alloy clad material for heat exchangers that exhibits superior strength after brazing and excellent corrosion resistance (Abstract). Fukuda teaches that large Si compounds and Fe compounds with a (electrical) potential higher than the matrix cause preferential corrosion (col. 2, lines 28-34). A sacrificial anode material is clad onto an aluminum strip and possesses a prescribed number of such "large" Si and Fe intermetallic particles where the line for "large" particles is drawn at 1 micron of circle equivalent diameter. (col. 2, lines 54-64) These large particles are present to preferential corrode and thus protect the inner aluminum layer through galvanic protection.

Lastly, Fukuda teaches that Si and Fe compounds are dispersed in the sacrificial anode material matrix by adjusting the casting conditions of the aluminum alloy, in particular the casting temperature and the cooling rate (col. 5, lines 33-39).

Regarding claim 1, it would have been obvious to one of ordinary skill in the aluminum arts, at the time the invention was made, taking the disclosures of US '497

and Fukuda as a whole, to combine US '497 with Fukuda and continuous cast Al strip such that the intermetallic particles have an average size below above 1 micrometer^2. This is because both US '497 and Fukuda recognized the relationship between the casting rate and formation of intermetallic particles when continuously casting Al strip stock for heat exchanger components. While US '497 taught that large particles should be avoid due to later problems with rolling thin foil, Fukuda then suggest that Fe and Si intermetallic particles with a size of greater than about 1 micrometer^2 preferentially corrode in a sacrificial anode layer. If one then is not using such a sacrificial anode layer then these large particles would plainly create pitting corrosion as suggested by Fukuda and one would be motivated to avoid the formation of such particles by controlling the casting process (particularly cooling rate as taught by both references) as Pitting corrosion is to be assiduously avoided in the core layer, which is what is being manufactured in the case of US '497.

Regarding claim 2, US '497 teaches that the sheets are further annealing during cold rolling (col. 3, lines 30-32, col. 5, lines 5 and 27-30).

Regarding claim 6, US '497 teaches that the Al strip is cold rolled to a final gauge of 60 micron (0.06 mm) (Figure 1 and Abstract).

7. **Claims 3 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over **US '497** in view of **Fukuda** as applied to claims 1-2 and 6 above, in further view of **US '006** (US 6,531,006 B2).

The disclosures of US '497 and Fukuda were discussed above, however neither reference taught the intermediate annealing gauge as 0.58 mm.

US ‘006

US ‘006, in a very similar Al strip production process, teaches that after continuous casting, the Al strip is cold rolling to an interanneal gauge of 0.5-3.0 mm (col. 2, lines 55-63).

Regarding claim 3, it would have been obvious to one of ordinary skill in the aluminum arts, at the time the invention was made, taking the disclosures of US ‘497m Fukuda, and US ‘006 as a whole, to incorporate the inter-annealing gauge of US '006 into the Al strip production process as taught by US ‘497 in view of Fukuda as US ‘006 is drawn to the same problem as US ‘497 in how to produce thin foil Al strip stock for heat exchangers.

Regarding claim 12, US ‘497 taught that the alloy is cast to a strip between 3 and 20 mm thick, and then cold rolled to an interanneal gauge while US '006 adds that such an interanneal gauge should be 0.5 - 3 mm (col. 2, lines 54-63). MPEP 2144.05, para I states: “In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists.”

8. **Claims 4 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **US '497** in view of **Fukuda** as applied to claims 1-2 and 6 above, in further view of **Ziegler** (US 3,827,917 A1) and **ASM Handbook** (Heat Treating of Aluminum Alloys -- Annealing, in ASM Handbook (revised Vol. 4) Metals Handbook, (1998).).

The disclosures of US ‘497 and Fukuda were discussed above, however neither reference teaches heating or cooling rates in relation to the annealing step.

Ziegler

Ziegler is drawn to the production of aluminum strips with controlled Fe intermetallic particle sizes and distribution (Abstract, col. 1, lines 15-20). As with US '497 and Fukuda, the intermetallic particle sizes are controlled by the initial casting method (col. 1, lines 15-43).

Ziegler teaches an annealing step where the Al strip is heated to 260 – 482 °C (col. 2, lines 55-72) and cooling to room temperature as a rate of 37.8 – 204.4 °C (col. 3, lines 1-8).

ASM Handbook

ASM Handbook, in the section on "Heat Treating of Aluminum Alloys – Annealing", teaches that the heating rate can be critical for aluminum alloys (p. 4, para 1).

Regarding claims 4 and 5, it would have been obvious to one of ordinary skill in the aluminum arts, at the time the invention was made, taking the disclosures of US '497, Fukuda, Ziegler, and ASM Handbook as a whole, to incorporate the cooling rate of Ziegler into the Al production process of US '497 in view of Fukuda and to optimize the heating rate as taught by ASM Handbook.

Ziegler teaches a cooling rate that overlaps the claimed cooling rate and ASM Handbook teaches that the heating rate during annealing as important in grain growth. Put another way, Ziegler and ASM Handbook teach that the heating and cooling rates are art recognized result effective variables. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed heating and cooling rates through process optimization, since it has been held that there

the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

One would be motivated to combine Ziegler as it relates to the production of Al stock material with controlled sizes and distribution of Fe intermetallic particles. Similarly, one would be motivated to combine ASM Handbook as it teaches general processing conditions that should be considered and optimized in the annealing of Al stock.

With respect to the annealing temperature of 340°C and the soak time of 3 hours, one of ordinary skill would be motivated in the course of routine optimization to work within the temperature and time ranges disclosed by US '497.

9. **Claims 13-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **US '497** in view of **Fukuda** as applied to claims 1-2 and 6 above, in further view of **US '006 , Ziegler,** and **ASM Handbook**.

The disclosures of US '497 and Fukuda were discussed above however neither reference teaches the heating or cooling rates. Similarly the disclosure of US '006, used to teach the interanneal gauge, was discussed in section 7 above while the disclosures of Ziegler and ASM Handbook, used to teach the cooling and heat rates respectively, were discussed in section 8 above.

Regarding claims 13-17, it would have been obvious to one of ordinary skill in the aluminum arts, at the time the invention was made, taking the disclosures of US '497, Fukuda, US '006, Ziegler, and ASM Handbook as a whole, to incorporate the

interanneal gauge of US '006, the cooling rate of Ziegler, and the teaching regarding the heating rate from ASM Handbook into the Al strip production process of US '497 in view of Fukuda. This is because US '006 is drawn to the same problem as US '497 in how to produce thin foil Al strip stock for heat exchangers, Ziegler is similarly drawn to the production of Al product with controlled size of Fe intermetallic particles, and ASM Handbook teaches general processing conditions that should be considered and optimized in the annealing of Al stock.

With respect to the annealing temperature of 340°C and the soak time of 3 hours, one of ordinary skill would be motivated in the course of routine optimization to work within the temperature and time ranges disclosed by US '497.

Regarding claims 18-20, US '497 teaches that the Al strip is cold rolled to a final gauge of 60 micron (0.06 mm) (Figure 1 and Abstract).

Conclusion

-- Claims 1-6 and 12-20 (All pending) are rejected
-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588. The examiner can normally be reached on Monday - Thursday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark L. Shevin/

/Roy King/

Supervisory Patent Examiner, Art Unit 1793

10-549,673
April 24th, 2008